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Ionic liquid pretreatment of sugarcane bagasse for bioethanol production

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Most of the energy demands of industrial and the transport sector is met from fossil fuels, however the reserves of which are limited and their usage is not eco-friendly. In recent years, growing attention has been devoted to the conversion of biomass into bioethanol, considered the cleanest liquid fuel alternative to fossil fuels. Sugarcane bagasse (SCB) represents a major agro residue in India that can be exploited for bioethanol generation. For an efficient dissolution of the biomass and its successive hydrolysis into fermentable sugars requires an efficient pretreatment strategy. Ionic liquids (IL) have emerged as an effective pretreatment method for breaking the complex structure of the lignocellulosic biomass. They are thermally stable, environmentally friendly, recyclable,

and have low volatility. The current study was planned for development of an optimized pretreatment process for SCB using ionic liquids. The ionic liquid stability of the cellulase and xylanase enzymes from the fungal isolates at different time intervals was analyzed. The fungi were isolated from various ecological niches including Sugarcane bagasse was pretreated by using selected ionic liquid 1-butyl-3-methylimidazolium chloride at various concentrations (5%-30%) and subsequently saccharified by IL stable fungal cellulase. The total sugar yield obtained was maximum at 25% ionic liquid concentration with 242.64mg sugar yield per 1g of the biomass after 24 h of saccharification.

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